

MISSION STATUS BULLETIN

VOYAGER

September 5, 1977



No. 7

STATUS SUMMARY

Voyager 1 is in celestial cruise, and, twelve hours after launch, was about 430,000 kilometers (267,000 miles) from Earth, having passed the Moon two hours earlier at a distance from the surface of 92,000 kilometers (57,000 miles).

Voyager 1 is locked on both the Sun and its reference star Canopus, stabilized on three axes, and returning good data. All of the booms and antennas have deployed normally and are locked into position. All of the science instruments scheduled for turn-on at this point are on and operating well, except for the photopolarimeter which has been turned off to protect it from an undesirably high level of reflective light from the Moon ("moon shine").

Voyager 2 continues in its quiescent state, over 14 million kilometers (8½ million miles) from Earth. Real-time science commands will be sent at predefined opportunities during the quiet period. The photopolarimeter instrument has been turned off.

CURRENT STATUS

Voyager 1

Voyager 1, aboard a Titan III E/Centaur launch vehicle, lifted off launch complex 41 at the Air Force Eastern Test Range (AFETR), Cape Canaveral, Florida, at 8:56:01 a.m., EDT (5:56:01 a.m., PDT), September 5, 1977, sixteen days after its twin. The launch countdown went smoothly with no unscheduled holds.

Voyager 1's computing systems are operating well, with none of the attitude control problems encountered during the launch of Voyager 2. A switch to a secondary thruster system was noted during the magnetometer boom deployment; a reset to initial conditions was commanded about 12 hours after launch.

The sequence of events aboard the spacecraft following insertion into Earth orbit occurred according to schedule, with release and lock of the radioisotope thermoelectric generator, science, and magnetometer booms occurring about one hour after launch and deployment of the planetary radio astronomy and plasma wave subsystem antenna about an hour later.

**VOYAGER 1:
SEPTEMBER 5, 1977
8:56:01 a.m., EDT**



NASA

National Aeronautics and
Space Administration

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The spacecraft was stabilized on two axes about two hours into the flight when the sensors acquired the Sun, and achieved three-axis stabilization with Canopus acquisition several hours later.

During the launch phase, the launch vehicle's Titan Stage II burned for a shorter period than planned, necessitating a longer first burn by the Centaur stage. The first burn of the Centaur stage used about 545 kilograms (1200 pounds) more fuel than planned. The second Centaur burn, just prior to injection into the Jupiter trajectory, was shorter due to its lighter fuel load, and burned about 140 kilograms (310 pounds) more fuel than planned.

The effect of the short Titan burn is under study, but appears to have had no effect on the desired trajectory.

The final Jupiter trajectory insertion boost of the propulsion module provided a bonus by requiring less than 2 kilograms (4½ pounds) of hydrazine of an allotted 14 kilograms (31 pounds). This fuel-savings was also noted in Voyager 2 on August 20, giving both spacecraft an extra measure of fuel for attitude control.

The launch of Voyager 1 marks the last planned use of the Titan III E/Centaur launch vehicle, a combination which has completed six successful launches, including both of the Viking spacecraft to Mars and Voyager 2.

Voyager 1 carries a duplicate of the copper-plated, aluminum-jacketed "Sounds of Earth" recording carried by Voyager 2. Included with the 12-inch disc is a cartridge and needle, and instructions on how to play the record. In addition to greetings in 60 human languages, a sound essay on the evolution of our planet, and a selection of music, the record includes data which can be reconstructed to form 115 photographs and diagrams, 20 of which are in color. The idea of the records is somewhat like tossing a note in a bottle into the ocean — in this case, a cosmic ocean.

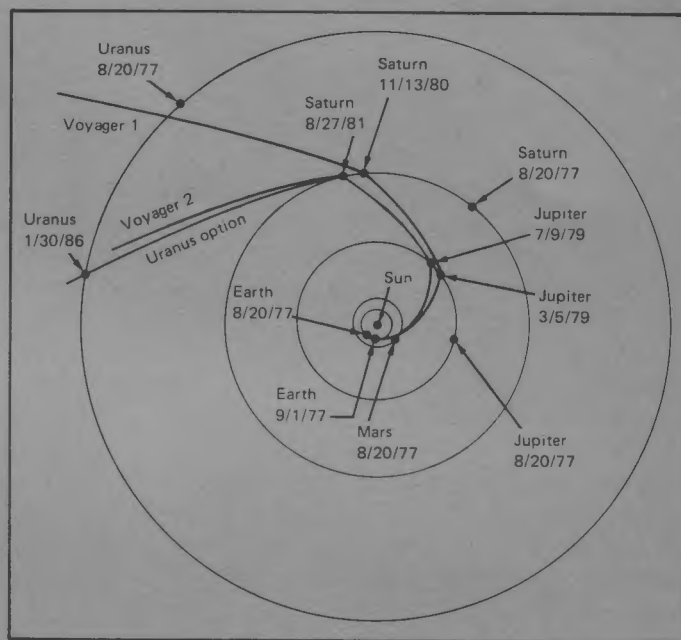
Although launched 16 days after its twin, Voyager 1, due to the alignment of the planets at the time of the launch, will fly a faster trajectory relative to the Sun and will arrive at Jupiter four months ahead of Voyager 2, beginning its observations in mid-December, 1978. Voyager 1 will travel a total of 998 million kilometers (620 million miles) to Jupiter.

Voyager 2

Voyager 2 is in a quiet mode, with little activity planned until about September 20 except for occasional science commands.

The photopolarimeter instrument has been turned off due to the sticking of the analyzer wheel. The instrument will remain off to protect it from the Sun's rays until the problem can be analyzed and corrected.

Voyager 2 will travel a total of 1.2 billion kilometers (699 million miles) to Jupiter, beginning its observations in April, 1979, 20 months after launch.



VOYAGER TRAJECTORIES. The Voyager spacecraft will "chase" after the outer planets, as all orbit the Sun. The trajectory plot above, looking down from a point above the Sun's north pole, shows the position of the planets at the time of Voyager 2 launch, August 20, 1977. Voyager 1 dates will be slightly later due to the 4-day launch slip from the original schedule. Voyager 2 began its journey by travelling between the Sun and the Earth's orbit (see insert below) but soon sped away from the warmer regions near the Sun into colder deep space.

